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EXAMINER	
ABOAGYE, MICHAEL	
ART UNIT	PAPER NUMBER
1793	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/507,213	BIRGEL, DIETMAR	
	Examiner	Art Unit	
	MICHAEL ABOAGYE	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 March 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *33-37,41-44,49,65 and 66* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *33-37, 41-44, 49, 65 and 66* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

1. Claims 33-37, 41-44, 49, 65 and 66 remain pending in the application.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 33, 35 and 65 are rejected under 35 U.S.C. 102(b) as being anticipated by Shibo et al. (US Patent No. 6123247).

Regarding claim 65, Shibo et al. teaches a method for populating and soldering a circuit board (32, figure 6) having a first side and a second side and at least one wired, electrical component ("THT-component") having at least one connection wire or connection pin and a housing or casing thermally critical for conventional (see, the component 57, figure 6), automatic soldering technology, comprising the steps of: populating on the first side of the circuit board with the at least the THT-component with the connection wire or pin stuck from the first side through a hole and emerging on the second side of the circuit board in the area of a soldering contact surface printed with a solder paste(see all the wire components which are non heat resistant are placed on the first or the upper side of the PCB, see figure 6 and column 3, line 62-column 4, line 40);

placing the circuit board so populated into a reflow oven for the soldering (see, abstract, column 1, lines 35-46, and column 3, lines 62-67); and at least partially shielding the first side populated with the THT-component, by the circuit board itself, from a heat or energy feed effecting the soldering in the reflow oven, from the heat or energy feed acting on the second side for the soldering, wherein in an essentially horizontal arrangement of the circuit board during travel through the reflow oven for soldering the THT-components are located underneath the circuit board(Note the hot air or the heat feed 101 as in figure 6, acts on the second side of the PCB 32 on which the heat resistance component 37 is placed). Shibo et al. also teaches a circuit board arranged horizontally during travel through the reflow oven by a conveyor (81, figures 1A and 5, and column 2, lines 43-60) for the soldering; wherein THT-components are located on a side of the circuit board opposite that of the heat resistant components (Note, the limitation calling for THT-component to be located underneath the circuit board is noted, however one of ordinary skill in the art reading the claims in light of the applicant's disclosure, would appreciate that said limitation "underneath" can be interpreted to mean, that side of the circuit board opposite the direction of the heat feed). Shibo et al. further teaches THT component(s) of low heat resistant located at a side of the circuit board opposite the direction of the heat feed or the hot side (101) thereby enabling said components to be thermally shielded or separated from the direct heat by the circuit board itself (also see, column 4, lines 33-40 and figure 6). It should be pointed out that though in figure 6, cool air (102) is used for cooling and regulating the temperature on the side of the non-heat resistant components, regardless said

components are thermally separated by the circuit board itself, therefore said component would inherently be shielded by the printed circuit board (see, column 3, line 62-column 4, line 50).

Regarding claim 33, Shibo et al. teaches comprising the step of: applying solder paste to solder contact (see, column 4, lines 33-40 and column 5, lines 11-25) surfaces provided on the second side of the circuit board for a populating of the second side of the circuit board with at least one SMD-component, wherein: following populating of the second side of the circuit board with the SMD-component, it is soldered, together with the connection wire of the THT-component, in the reflow oven (Note Shibo et al. teaches a one step process by which both the heat resistance and the non-heat resistant components are solder in one pass reflow, column 5, line 53 – column 6, lie 10 and column 7, lines 34-61).

Regarding claim 35, Shibo et al. teaches having at least one SMD-component populated at the first side of the circuit board (see, the heat resistant surface mountain component (SMD) 37, figure 6).

Claim Rejections - 35 USC § 102/103

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 34, 36 and 66 are rejected are rejected under 35 U.S.C. 102(b) as being anticipated by, or in the alternative under or 35 U.S.C. 103(a) as being obvious over Shibo et al. (US Patent No. 6123247)

Regarding claim 66, Shibo et al. teaches a method for populating and soldering a circuit board (32, figure 6) having a first side and a second side and at least one wired, electrical component ("THT-component") having at least one connection wire or connection pin and a housing or casing thermally critical for conventional (see, the component 57, figure 6), automatic soldering technology, comprising the steps of: populating on the first side of the circuit board with the at least the THT-component with the connection wire or pin stuck from the first side through a hole and emerging on the second side of the circuit board in the area of a soldering contact surface printed with a solder paste (see all the wire components which are non heat resistant are placed on the first or the upper side of the PCB, see figure 6 and column 3, line 62-column 4, line 40); placing the circuit board so populated into a reflow oven for the soldering (see, abstract, column 1, lines 35-46, and column 3, lines 62-67); thermally separating the first side populated with the THT-component by the circuit board itself, from the heat or energy feed acting on the second side for the soldering (Note the hot air or the heat feed 101 as in figure 6, acts on the second side of the PCB 32 on which the heat

resistance component 37 is placed). Shibo et al. also teaches a circuit board arranged horizontally during travel through the reflow oven by a conveyor (81, figures 1A and 5, and column 2, lines 43-60) for the soldering; wherein THT-components are located on a side of the circuit board opposite that of the heat resistant components (Note, the limitation calling for THT-component to be located underneath the circuit board is noted, however one of ordinary skill in the art reading the claims in light of the applicant's disclosure, would appreciate that said limitation "underneath" can be interpreted to mean, that side of the circuit board opposite the direction of the heat feed) Shibo et al. further teaches THT component(s) of low heat resistant located at a side of the circuit board opposite the direction of the heat feed or the hot side (101) thereby enabling said components to be thermally shielded or separated from the direct heat by the circuit board itself (also see, column 4, lines 33-40 and figure 6). Therefore shielding THT component(s) from the heat feed by the circuit board would be inherent.

In the alternative one of ordinary skill in the art would obviously recognize that the printed circuit board act as a thermal barrier or shielding means to protect the non-heat resistant components), because the non-heat resistant components are thermally separated by the circuit board itself from the heat feed (see, column 3, line 62-column 4, line 50).

Shibo et al. fails to teach the specific minimum temperature difference between the first side and the second side as set forth in this claim. However Shibo et al. teaches directing hot air at a temperature of about 420-450 degrees Celsius to the first side (hot side having the heat resistant components) and directing cold air at about 90 degrees

Celsius to regulate the temperature of the second side (cold side, having the non-heat resistant component) therefore by invoking on basic concept of heat transfer and heat balance one of ordinary skill would appreciate that the heat differential between the first side and the second side would at least exceed 28 degrees Celsius.

Regarding claim 34, Shibo et al. teaches comprising the step of: applying solder paste to solder contact (see, column 4, lines 33-40 and column 5, lines 11-25) surfaces provided on the second side of the circuit board for a populating of the second side of the circuit board with at least one SMD-component, wherein: following populating of the second side of the circuit board with the SMD-component, it is soldered, together with the connection wire of the THT-component, in the reflow oven (Note Shibo et al. teaches a one step process by which both the heat resistance and the non-heat resistant components are soldered in one pass reflow, column 5, line 53 – column 6, lie 10 and column 7, lines 34-61).

Regarding claim 36, Shibo et al. teaches having at least one SMD-component populated at the first side of the circuit board (see, the heat resistant surface mountain component (SMD) 37, figure 6).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 37 and 41-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shibo et al. (US Patent No. 6123247) as described in claim 65 above and further in view of Wentworth (US Patent No. 5373984).

Regarding claim 37, Shibo et al. teaches a single pass solder reflow process of mixed technology wiring boards containing both surface mount components (SMD) of high heat resistance and plated through-hole components (THT) of low heat resistance, but fails to teach the two pass reflow process as set forth in claim 37.

Wentworth teaches a two pass solder reflow process of mixed technology wiring boards containing both surface mount components (SMD) and plated through-hole components (THT), (see Wentworth, abstract); wherein a conductive adhesive (note the conductive adhesive includes solder paste, (see, column 6, lines 34-38)) is applied to a first side of the circuit board and populated with SMD; applying conductive adhesive to a location of said first side and populating with plated through-hole components (THT), soldering by reflowing to adhere the plurality of surface mount components on the first side of the circuit board (see Wentworth , column 2, lines 44-58), continuing a second pass by applying conductive adhesive to a second side of the circuit board and populated with SMD; applying adhesive to a location of said second side and populating with plated through-hole components (THT), soldering by reflowing to adhere the plurality of surface mount components on said second side of the circuit board (see, Wentworth, column 2, line 58-column 3, line 14). Reading Wentworth, one of ordinary skill in the art would readily appreciate that surface mount components and plated

through-hole components of the same thermal or heat tolerance can be mixed populated on common side of a double sided circuit board and reflow at the same time.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process of, Shibo et al. to use a sequential or two pass reflow process as taught by Wentworth which would have meant substituting one known reflow alternative for another which allows mixed surface mount components and plated through-hole components of the same thermal or heat tolerance to be mixed populated on the same side of a double sided circuit board and reflow at the same time (see Wentworth , column 2, line 44- column 3, line 14).

Regarding claim 41, Shibo et al. is silent on adhesive, however, Wentworth recite conductive adhesive for securing both the SMD and the THT-component; wherein said conductive adhesive encompasses solder paste (see, column 6, lines 34-38). The selection of an appropriate conductive adhesive to secure THT-component would have been within purview of one of ordinary skill in the art since said adhesive is not limited to solder.

Regarding claim 42 and 43, both Shibo et al. and Wentworth teach securing the THT-component in the through-hole of the circuit board, but are silent on the mechanical snap-in mechanism as set forth in claims 42 and 43. However said mechanical snap-in mechanism is known as convention in the art for securing THT-component onto a circuit board (Furthermore support for said assertion can also be found in the applicant's specification, last paragraph of page 11). Selection of said

mechanical snap-in mechanism to secure the THT-component onto the circuit board would have been within purview of one of ordinary skill in the art.

Regarding claim 44, Shibo et al. teaches a single pass solder reflow process of mixed technology wiring boards containing both surface mount components (SMD) and plated through-hole components (THT), but fails to teach the two pass reflow process as set forth in claim 44.

Wentworth teaches a two pass solder reflow process of mixed technology wiring boards containing both surface mount components (SMD) and plated through-hole components (THT), (see Wentworth, abstract); wherein a conductive adhesive (note the conductive adhesive includes solder paste, (see, column 6, lines 34-38)) is applied to a first side of the circuit board and populated with SMD; applying conductive adhesive to a location of said first side and populating with plated through-hole components (THT), soldering by reflowing to adhere the plurality of surface mount components on the first side of the circuit board (see Wentworth , column 2, lines 44-58), continuing a second pass by applying conductive adhesive to a second side of the circuit board and populated with SMD; applying adhesive to a location of said second side and populating with plated through-hole components (THT), soldering by reflowing to adhere the plurality of surface mount components on said second side of the circuit board (see, Wentworth, column 2, line 58-column 3, line 14). Reading Wentworth, one would of ordinary skill in the art would readily appreciate that surface mount components and plated through-hole components of the same thermal or heat tolerance can be mixed populated on common side of a double sided circuit board and reflow at the same time.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process of, Shibo et al. to use a sequential or two pass reflow process as taught by Wentworth which would have meant substituting one known reflow alternative for another which allows mixed surface mount components and plated through-hole components of the same thermal or heat tolerance to be mixed populated on the same side of a double sided circuit board and reflow at the same time (see Wentworth , column 2, line 44- column 3, line 14).

Response to Arguments

8. Applicant's arguments filed 03/30/2010 have been fully considered but they are not persuasive.

Applicant argues that the rejection of independent claim 66 as anticipated by Shibo et al., and claim 66 as being also obvious over Shibo et al. is misapplied. That the Examiners' position that the circuit board of Shibo et al. inherently meet the shielding limitation..", is simply cannot be correct. That if the circuit board were a shielding member then why would Shibo et al need a mask pallet 103. Either the circuit board is a shield or it is not, and if it were then the mask pallet 103 would not be necessary.

In response, the Examiner disagrees with Applicant position, because contrary to Applicant's assertion, the mask pallet (103) is not provided for shielding the first side populated with the non-heat resistant components from a heat or energy feed effecting the soldering, but rather the mask pallet is a feature provided to shut off the cold air from reaching certain portions of the first side of the circuit board. Also the mask (103) is

provided with holes (103a) that allow the cold air (102) to pass and cool the non-heat resistant components (see, Shibo et al. column 3, line 62-column 4, line 40 and figure 6). Furthermore the circuit board of Shibo is arranged such that it separates the non-heat resistant components on the first side of the board from the heat or energy feed directed onto the second side of the circuit board. Therefore, it is taken that the "circuit board itself" serves as a heat shield.

Conclusion

9. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL ABOAGYE whose telephone number is (571)272-8165. The examiner can normally be reached on Mon - Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ Roy King/
Supervisory Patent Examiner, Art Unit 1793

/M. A./
Examiner, Art Unit 1793